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W314 W316 W320 W324 W330
U1S S1571 S1591 S1597 S3037 S3038 S3073

(56) Documents Cited

GB 0536740 A US 3816117 A
JAPIO Abstract No: 00281497 & JP 53083497A

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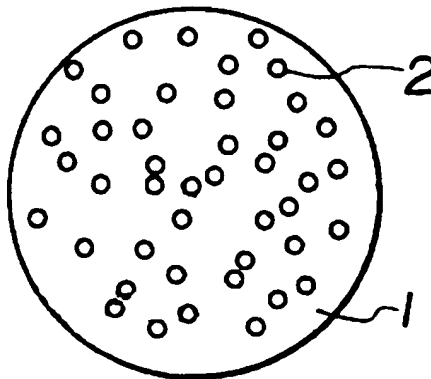
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ONLINE:CLAIMS, JAPIO, WPI

(54) Materials exhibiting colour

(57) The colour material (e.g. a filament or yarn) comprises minute granules 2 dispersed in a transparent substance 1. The materials and refractive indices of the transparent substance and of the granules are selected in such a manner as to exhibit a visible color produced by reflection and scattering of incident light. Alternatively, the structure comprises minute granules dispersed in at least one of first and second layers laminated alternately.

The transparent substance may be a synthetic resin, as may be the granules. Alternatively the granules are of calcium carbonate, zinc sulphate, zinc white, lithopone, cadmium sulphate, chrome oxide or titanium dioxide.

FIG.1A



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CLAIMS:-

1. A structure exhibiting a color produced by reflection and scattering of incident light, the color having a wavelength within the visible range, the color exhibition structure comprising:

a transparent substance having a first refractive index;
and

minute granules dispersed in the transparent substance, the granules having a second refractive index greater than the first refractive index.

2. A color exhibition structure as claimed in claim 1, wherein the transparent substance comprises a high molecular resin.

3. A color exhibition structure as claimed in claim 1, wherein the transparent substance comprises polyester, polyacrylonitrile, polystyrene, nylon, polypropylene, polyvinyl alcohol, polycarbonate, polymethyl methacrylate, polyether ether ketone, polyparaphenylene terephthalide, or polyphenylene sulfide, or a copolymer or mixture of at least two of these.

4. A color exhibition structure as claimed in any preceding claim, wherein the granules have a diameter corresponding to the wavelength of the color produced.

5. A color exhibition structure as claimed in any preceding claim, wherein the granules substances have a diameter of 1.25 μm or less.

6. A color exhibition structure as claimed in any of claims 1 to 5, wherein the granules are made of at least one material selected from calcium carbonate, zinc sulfate, zinc

white, lithophone, cadmium sulfat , chrome oxide, rutile type titanium dioxide, and anatase type titanium dioxide.

7. A color exhibition structure as claimed in any of claims 1 to 5, wherein the granules are made of titanium dioxide.

8. A color exhibition structure as claimed in any preceding claim, wherein the difference between the first and second refractive indexes is at least 0.4.

9. A structure for exhibiting a color produced by reflection, interference, and scattering of incident light, the color having a wavelength within the visible range, the color exhibition structure comprising:

a plurality of first layers of a material having a first refractive index;

a plurality of second layers of a material having a second refractive index different from the first refractive index;

the first and second layers being laminated alternately; and

minute granules dispersed in at least one of the first and second layers, the granules having a third refractive index different from the first and second refractive indexes.

10. A color exhibition structure as claimed in claim 9, wherein both of the first and second layers are made of a transparent high molecular resin.

11. A color exhibition structure as claimed in claim 9, wherein the first layers are made of a material selected from polyester, polyacrylonitrile, polystyrene, nylon, polypropylene, polyvinyl alcohol, polycarbonate, polymethyl methacrylate, polyether ether ketone, polyparaphenylene

terephthalide, polyphenylene sulfide, and copolymers and mixtures of at least two of these, and the second layers are made of a material selected from polyester, polyacrylonitrile, polystyrene, nylon, polypropylene, polyvinyl alcohol, polycarbonate, polymethyl methacrylate, polyether ether ketone, polyparaphenylene terephthalide, polyphenylene sulfide, and copolymers and mixtures of at least two of these.

12. A color exhibition structure as claimed in claim 9, wherein the first layers are in the form of air layers and the second layers are made of a transparent high molecular resin.

13. A color exhibition structure as claimed in claim 12, wherein the second layers are made of a material selected from polyester, polyacrylonitrile, polystyrene, nylon, polypropylene, polyvinyl alcohol, polycarbonate, polymethyl methacrylate, polyether ether ketone, polyparaphenylene terephthalide, polyphenylene sulfide, and copolymers and mixtures of these.

14. A color exhibition structure as claimed in any of claims 9 to 13, wherein the granules have a diameter corresponding to the wavelength of the color produced.

15. A color exhibition structure as claimed in any of claims 9 to 14, wherein the granules substances have a diameter of about $1.25\text{ }\mu\text{m}$ or less.

16. A color exhibition structure as claimed in any of claims 9 to 15, wherein the granules are made of at least one material selected from calcium carbonate, zinc sulfide, zinc white, lithophone, cadmium sulfate, chrome oxide, rutile type titanium dioxide, and anatase type titanium dioxide.

17. A color exhibition structure as claimed in any of claims 9 to 15, wherein the granules are made of titanium dioxide.

18. A color exhibition structure substantially as described with reference to any of the embodiments illustrated in the accompanying drawings.

19. A color exhibition structure substantially as described in any of Examples 1 to 5 herein.



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Examiner: Miss Maureen M.
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Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

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Other: ONLINE:CLAIMS, JAPIO, WPI

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
X	GB 0536740 A THE TITANIUM ALLOY MANUFACTURING COMPANY see the whole document	1 to 8
X	US 3816117 A EASTMAN KODAK see column 5, line 38, to column 8, line 62, column 9, line 65, to column 10, line 9, and the Examples	1 to 8
X	JAPIO Abstract No: 00281497 & JP 53083497A (SEIKO EPSON) 22.07.1978 see abstract	1 at least

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.